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# PATENT SPECIFICATION

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(72) Inventor DAVID JOHN POTTIE



## (54) IMPROVEMENTS IN OR RELATING TO CLAMPS FOR FLAT CABLES

(71) We, HAWKER SIDDELEY AVIATION LIMITED, a British company of Richmond Road, Kingston-Upon-Thames, KT2 5QS, Surrey, do hereby

5 declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

10 This invention relates to electrical installations and particularly those employing flat cable. By flat cable is meant cable having a number of parallel flat conductors embedded and supported in a flat strap or 15 web of a suitable insulating medium, the conductors being spaced apart across the width of the web.

It is desirable that flat cable be adequately 20 clamped and supported along its installed length. Particularly in the case of an aircraft installation it is important that the retention should be positive but at the same time lightweight and simple in construction and use. It is an object of the invention to 25 achieve these requirements by the provision of a clamp able to support and restrain one or more flat cables.

According to the present invention, there 30 is provided a clamping device comprising a base block adapted to receive securing means and having perpendicularly or approximately perpendicularly extending end flanges, and a flat-bar-like retaining block, with inter-engaging ratchet type teeth or 35 serrations on the flanges and retaining block such that the retaining block can be pushed into progressively closer locked relationship with the base block, with the retaining block or the major part of it moving progressively 40 farther in between said end flanges, until one or more flat cables passing between the retaining block and the base block are securely gripped.

In the preferred form, the sawtooth 45 serrations are on the outsides of the flanges and the retaining block has apertures near its ends through which the flanges on the base block can pass when the flanges are

sprung inward slightly, the edges of the apertures that are nearest the ends of the retaining block being shaped to engage with the serrations on the flanges. 50

Arrangements according to the invention will now be described by way of example and with reference to the accompanying drawings in which:—

Figure 1 is an exploded pictorial view of the first embodiment to be described,

Figure 2 is a pictorial view of the device of Figure 1 used in clamping cables,

Figure 3 shows the base block of a second embodiment in part sectional elevation, and

Figure 4 shows, also in part-sectional elevation, the base block of Figure 3 and its retaining block in co-operation.

Referring to the drawings, Figure 1 shows an exploded arrangement of the clamp to be described. A clamp block 1 has perpendicular end flanges 2 whose inner faces 3 are spaced apart from each other an amount sufficient to accommodate the required width of flat cables. Each inner face is formed with a number of sawtooth serrations 4 corresponding in form and pitch to serrations at the ends 5 of a flat-bar-like retaining block 6 which also has four corner locating lugs 7 projecting beyond the serrations. The base 8 of the clamp block is formed with attachment holes 9, the upper surface of the block base being locally recessed for rivet head clearance while the lower surface 10 may also be recessed if required to provide attachment location on adjacent structure. For preference, both the clamp block 1 and the retaining block 6 are manufactured from glass-filled nylon, but dependent on operational requirements, any suitable material may be employed which has sufficient elasticity to enable the end flanges to be slightly sprung to permit and retain engagement with the serrations of the retaining block. The assembly further comprises at least two elastomeric foam clamp pads 11 having recessed ends 12 with corner lugs and of a length corresponding substantially with the distance between the

flanges of the block 1, for sideways retention.

Figure 2 shows an installed cable assembly in which a number of flat cables 13 are retained between the base of the clamp block 1 and the retaining block 6, being sandwiched between the clamp pads 11, these latter being to facilitate clamping and to prevent fretting of the cables upon the clamp block base and upon the retaining block 6. The retaining block 6 is inserted between the end flanges 2 of the block 1 as far down as it will go, the serrations at the ends of the retaining block passing over those on the insides of the flanges 2 with a ratchet type action until a position of locking engagement is achieved in which the cables are adequately clamped. It will be understood that such a clamp assembly readily receives one or a greater number of cables without any change of the component parts.

Referring now to Figures 3 and 4, in that embodiment a clamp block 21 has approximately perpendicular end flanges 22 whose inner faces 23 are spaced apart from each other by a distance sufficient to accommodate the required width of flat cable. Each outer flange face 24 is formed with a number of sawtooth serrations 25 which co-operate with an outer inclined edge or serrations 26 of a respective one of two slots 27 formed in a flat-bar-like retaining block 28 near the ends thereof. These slots 27 are spaced apart such that the end flanges 22, being inclined outwardly, require to be pressed inward in order to engage the slots and thus ensure good locking engagement. The base 29 is formed with attachment holes 30 and in this embodiment a proprietary fastening is used, but normal bolting methods are equally satisfactory.

To ensure firm cable clamping, the upper surface 31 of the base 29 is slightly convex in profile; alternatively or in addition, the underside of the retaining block 28 may incorporate a strip of expanded polythene or similar material to enhance the desired cable clamping effect.

A number of channels 32 are provided in the retaining block 28 to receive cable ties

for attachment of further cables to the outside of the block.

WHAT WE CLAIM IS:—

1. A cable-clamping device for flat cables, comprising a base block adapted to receive securing means and having perpendicularly or approximately perpendicularly extending end flanges, and a flat-bar-like retaining block, with inter-engaging ratchet type teeth or serrations on the flanges and retaining block such that the retaining block can be pushed into progressively closer locked relationship with the base block, with the retaining block or the major part of it moving progressively farther in between said end flanges, until one or more flat cables passing between the retaining block and the base block are securely gripped. 55

2. A device according to Claim 1, wherein the serrations are on the outsides of the flanges and the retaining block has apertures near its ends through which the flanges on the base block can pass when the flanges are sprung inward slightly, the edges of the apertures that are nearest the ends of the retaining block being shaped to engage with the serrations on the flanges. 60

3. A device according to Claim 2, wherein, before the retaining block is assembled thereon, the flanges of the base block have a natural outward inclination away from one another. 65

4. A device according to Claim 1 or Claim 2 or Claim 3, wherein a protective elastic pad or pads are interposed between one or both blocks and the cable or cables. 70

5. A device according to any one of the preceding claims, wherein the upper surface of the base block is slightly convex. 75

6. A cable-clamping device for flat cables, substantially as described with reference to Figures 1 and 2 or Figures 3 and 4 of the accompanying drawings. 80

For the Applicants,  
LLOYD WISE, BOULY & HAIG,  
Chartered Patent Agents,  
Norman House,  
105—109 Strand,  
London WC2R 0AE. 85

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FIG. 1.

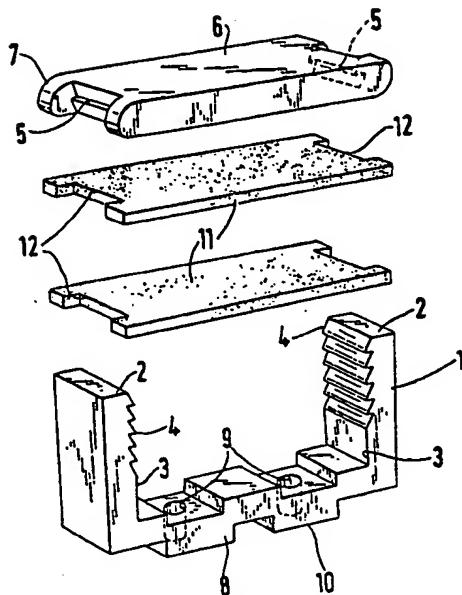


FIG. 2.

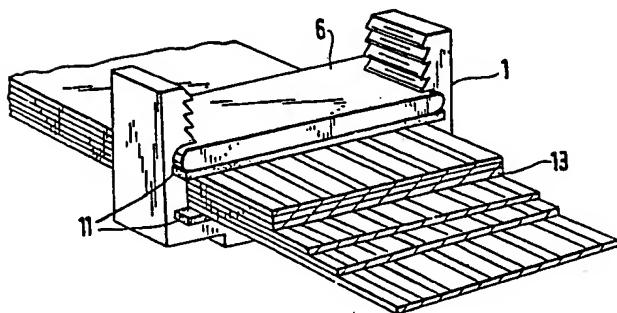


FIG. 3.

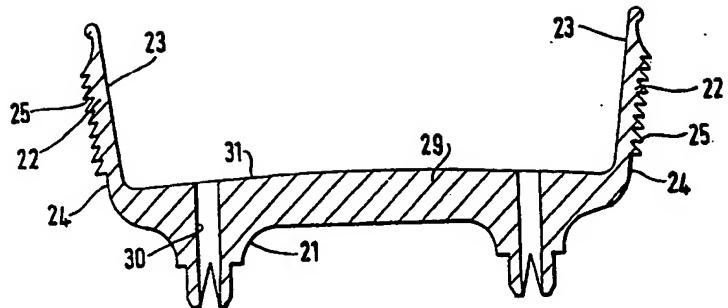


FIG. 4.

